"Sólok," the English "Sooloo," sometimes "Sulo" &c., the Germans chiefly "Sulu;" and the name has been written in still half a dozen other ways. As the natives on the spot say "Sólog," with a soft "s," it may perhaps be recommended to write the word in this manner.

Vienna, April 4, 1874.

Contributions towards the Natural History of the Termites.
By Dr. Fritz Müller.

In 1856 C. Lespès discovered that both the soldiers and the workers of *Termes lucifugus* of the Landes were represented by male and female individuals with incompletely developed sexual organs. This statement was received with some hesitation by certain naturalists, and especially by Hagen, who sought in vain for these organs in the soldiers of various species of *Termes* and *Hodotermes*. M. Fritz Müller's observations have dispelled the apparent contradictions which rendered this question obscure, and they reveal to us new facts of the highest interest in the history of the Termites.

At first M. Fritz Müller was no more fortunate than Hagen in dissecting workers or soldiers belonging to several different groups of the genus *Termes* proper. But in the workers and soldiers of the genus *Calotermes* he found the organization indicated by Lespès; and he even ascertained that in the soldiers of this group the reproductive organs are much less atrophied than in those of *Termes lucifugus*, and they acquire nearly the same development as in the winged individuals.

In the soldiers of *Calotermes canellæ* scarcely any external sexual differences are to be found; the ventral plates of the abdomen in the male and female soldiers are constructed as in the winged males. The reproductive organs of the female soldiers are scarcely distinguishable from those of the winged females, except by their slightly smaller size and the absence of the seminal receptacle. The contents of the tubes present some differences when compared with what is seen in the females. The reproductive organs of the male soldiers are exactly like those of the winged males, the testes alone being a little more slender in form.

In *Calotermes nodulosus* and *rugosus*, Hagen, the male are at once distinguished from the female soldiers by the structure of the eighth ventral arch. In the small number of female soldiers of *C. nodulosus* that he has dissected, the author did not find well characterized ova filling the whole calibre of the ovarian tubes; but he saw them in nearly all the female soldiers of *C. rugosus*.

As regards the organization of the workers of *Calotermes*, M. Müller can say nothing, for the very sufficient reason that in the five or six species of that genus which he has observed in Brazil there are no workers at all.

Two forms of nymph had often been observed in the colonies of Termites; but Lespès was the first to study and describe them carefully in *Termes lucifugus*. His "nymphs of the first form," larger than the workers and larvæ, are recognizable particularly by their

large, thick wing-sheaths, marked with lines representing veins; in these the female organs are well developed, the male organs very slightly. Lespès saw these nymphs change into perfect insects from the 15th to the 20th May. The "nymphs of the second form," less numerous than the preceding, become larger, owing to the considerable increase of the abdomen. In these the male and female organs acquire an enormous volume. Lespès supposed that these nymphs change in August into winged males and females; but he had made no direct observations upon this point.

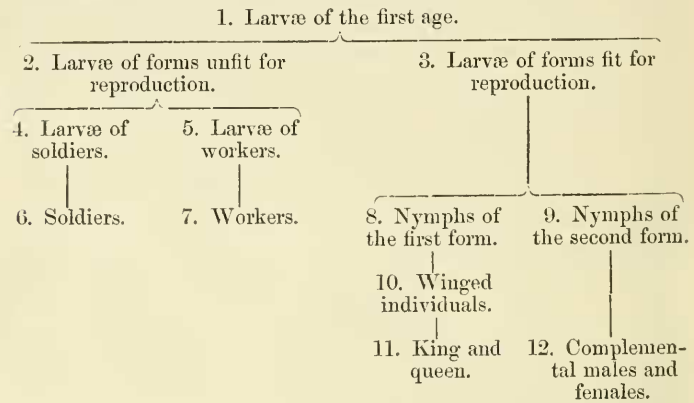
M. F. Müller has been led to form a different conception of the functions of these different nymphs. According to him, male and female reproductive individuals exist under two different forms; some, originating from the "nymphs of the first form," acquire wings and quit the nest, a small number of them surviving and becoming kings and queens: the others, which correspond to the "nymphs of the second form," are destined never to see the light; they remain apterous, and never quit the nest where they were born. The correctness of this hypothesis, which was put forward some time ago, has been proved by this clever naturalist by direct observation. In examining the central part of the nest of a *Eutermes*, he found it surrounded by a mass of eggs, and ascertained that it did not contain a great royal chamber, but was formed by a sponge-like combination of irregular passages. In these passages were collected, in little groups, thirty-one females with short wing-sheaths, from 6 to 8 millims. in length, in the midst of which a male, of nearly the same size, was walking about. This male was a true king, with large eyes; his wings had been detached, leaving only their basal portions. "Instead of a palace containing a king, living chastely with a mate of his own condition," says the author, "I had before me a harem in which a sultan was throned in the midst of numerous mistresses."

These females, whose abdomens were agitated by undulatory contractions, like those observed in the queens, laid a great number of eggs in the course of a day; and M. Müller several times witnessed the act of oviposition.

The complemental females (*Ersatzweibchen*), as M. Müller calls them, resemble the workers in their general appearance, but they are twice as large. Their rudimentary wings are so small as not to be perceived in most of them at the first glance. In a small number of individuals these organs acquire larger dimensions, coinciding with a greater development of the mesothorax and metathorax; they then attain the middle of the second dorsal arch of the abdomen. The head closely resembles that of the workers; as in the latter, the antennæ are of fourteen joints, whilst the soldiers have thirteen and the winged individuals fifteen. The only difference between the head in these females and in the workers consists in the presence of small rounded eyes, which scarcely project. The abdomen is only moderately inflated. Each ovary, composed of about a dozen ovarian tubes, contains about six mature ova. Fifteen complemental females together did not weigh more than a single queen; the

ovaries of the thirty-one females were not more than equal in weight to those of a queen, and contained scarcely as many ova.

Many questions still remain to be solved with regard to the complemental males, the nature of the descendants produced by the different forms of sexual individuals, the causes which induce the development of one or other of these forms, &c. Numerous observations and researches will be necessary to enable us to understand thoroughly the working of these complicated societies. Nevertheless one point seems to be gained, namely the knowledge of the different forms which may be met with in a colony of Termites. M. Fritz Müller gives the following table of them:—



The author has made numerous observations on the structure of the nests of Termites, and gives a great number of figures which are indispensable for the proper comprehension of these constructions. We must content ourselves with mentioning the curious fact that the excrements of the Termites seem to be the materials most employed by these insects, or at least by those which burrow into trees and construct nests in the form of excrescences. If a fragment of the nest be removed, the workers come one after the other to the breach and repair it by depositing their excrements, to which certain individuals add small fragments of the broken wall. Sometimes, also, those which have nothing in the rectum disgorge the food which they have not yet digested. This latter method, probably, is not employed in time of peace; the insects, no doubt, only have recourse to it when it is necessary to repair quickly a nest broken open by some enemy.

Termes Lespèsii, F. Müller, which builds upon the ground, does not exclusively employ its excrements, although these constitute the greater part of the material of the nest; its constructions consist partly of a clayey earth. The two substances usually form successive layers, which vary in thickness and arrangement in different parts of the nest.—*Jenaische Zeitschrift*, vol. vii. (1873) pp. 333–358 & 451–463; abstract in *Bibl. Univ., Arch. des Sci. Phys. et Nat.*, March 15, 1874, pp. 254–259.

Carcinus mænas, *Pennant.*

Mr. Wood Mason exhibited a specimen of *Carcinus mœnas*, Pennant, taken in 1866 or 1867 at Point de Galle, Ceylon, by Dr. J. Anderson. Comparison of this specimen with those from the Mediterranean lately received from Prof. Cornalia, of Milan, had enabled him to be sure of the correctness of his previous identification from the published figures and descriptions. The species appeared to have an exceedingly wide distribution, being found in abundance on the shores of the British Isles and of the United States, whence it extends to the Arctic Sea, and on all the Mediterranean coasts; it has also been recorded by Heller from Rio Janeiro; and specimens will doubtless ultimately be met with in the Red Sea.—*Proceedings of the Asiatic Society of Bengal*, November 1873.

Cetacea of the North Sea and the Baltic.

Professor Malm, in his 'Zoological Observations,' gives a comparative account of fifteen specimens of the common porpoise (*Phocæna Linnæi*) occurring in the Baltic. He describes and figures a gravid female, and young, and mentions the peculiarities of each specimen. He observes that the small tubercles on the front edge of the dorsal fin, on which Dr. Gray has established *Phocæna tuberculifera*, occur very rarely among these animals; he only found it in one specimen (no. 13) out of the whole of the male and female specimens which he examined; and therefore he thinks this species is still doubtful.

Professor Möbius gives an account of a male and female grey grampus (*Grampus griseus*), which were taken on the 17th and 19th of February 1871 on the west coast of Holstein, between the Elbe and Eider. I believe this is the first time that this southern species, which sometimes visits the south coast of England, has been recorded as found so far north.

Professor Möbius records the occurrence of the following species in the Little Belt:—

Phocæna communis, F. Cuvier.
Pseudorca crassidens, Gray. November 24, 1861.
Delphinus tursio, Otho Fabricius. June 1870.
Lagenorhynchus albirostris, Gray. Winter 1851–52.
Hyperoodon rostratum, Pontop. December 3, 1807.

J. E. Gray.

On some Extinct Types of Horned Perissodactyles. By Edward D. Cope, of Philadelphia, Penn.

It is well known that the type of Mammalia of the present period, which is preeminently characterized by the presence of osseous horns, is that of the Artiodactyla Ruminantia. At the meeting of the Association of last year, held at Dubuque, I announced that the horned mammals of our Eocene period were most nearly allied to the Proboscidians. I now wish to record the fact (as I believe, for the first time) that the Perissodactyles of the intermediate formation of the